

(12) UK Patent Application (19) GB (11) 2 258 145 (13) A

(43) Date of A publication 03.02.1993

(21) Application No 9215954.0

(22) Date of filing 27.07.1992

(30) Priority data

(31) 03067214

(32) 30.07.1991

(33) JP

(71) Applicant

Mitsuba Electric Manufacturing Co. Ltd

(Incorporated in Japan)

1-2681 Hirosawa-cho, Kiryu-shi, Gunma-ken,
Japan

(72) Inventor

Akiri Hayashi

(74) Agent and/or Address for Service

F J Cleveland & Co

40-43 Chancery Lane, London, WC2A 1JQ,
United Kingdom(51) INT CL⁵

B60S 1/04

(52) UK CL (Edition L)

A4F FAB F40

(56) Documents cited

GB 2228188 A

(58) Field of search

UK CL (Edition K) A4F FAB FAC FADA FADB FADC

FADD

INT CL⁵ B60S

Online databases: WPI

(54) Mounting structure for modular-type wiper device

(57) A mounting structure for a modular-type wiper device includes brackets 2, 5 provided with mounting holes A to D, one A of which has a diameter which is smaller than that of the remaining mounting holes B to D so as to reduce the clearance between it and the bolt passed therethrough. A mounting seat (25a, figure 4X) corresponding to this small-diameter mounting hole (A) is provided directly on a cowl (25) of a vehicle body, the wiper device being mounted on the vehicle body by using this mounting seat as a mounting reference. The holes A-D may be provided in metal cylindrical members 13a, 14a in setting rubbers 13, 14 located in mounting grooves 2d, 5c.

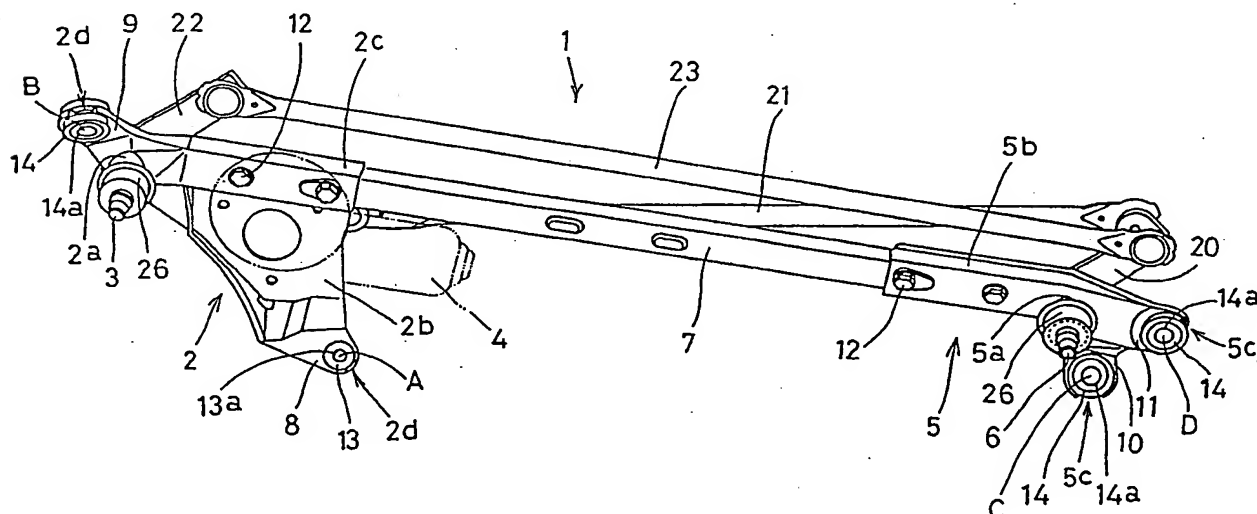
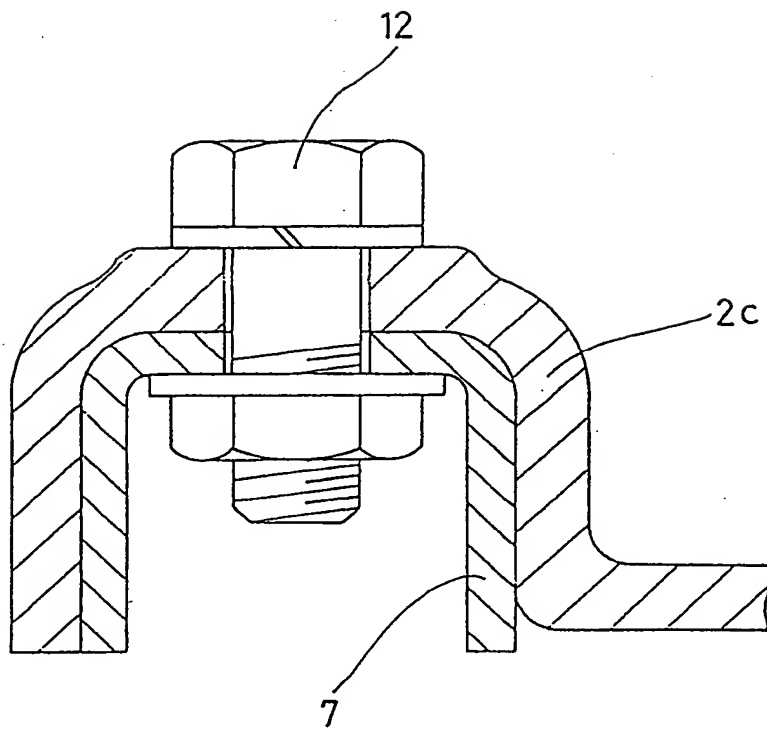


Fig 1

GB 2 258 145 A



Fig 3



(X)

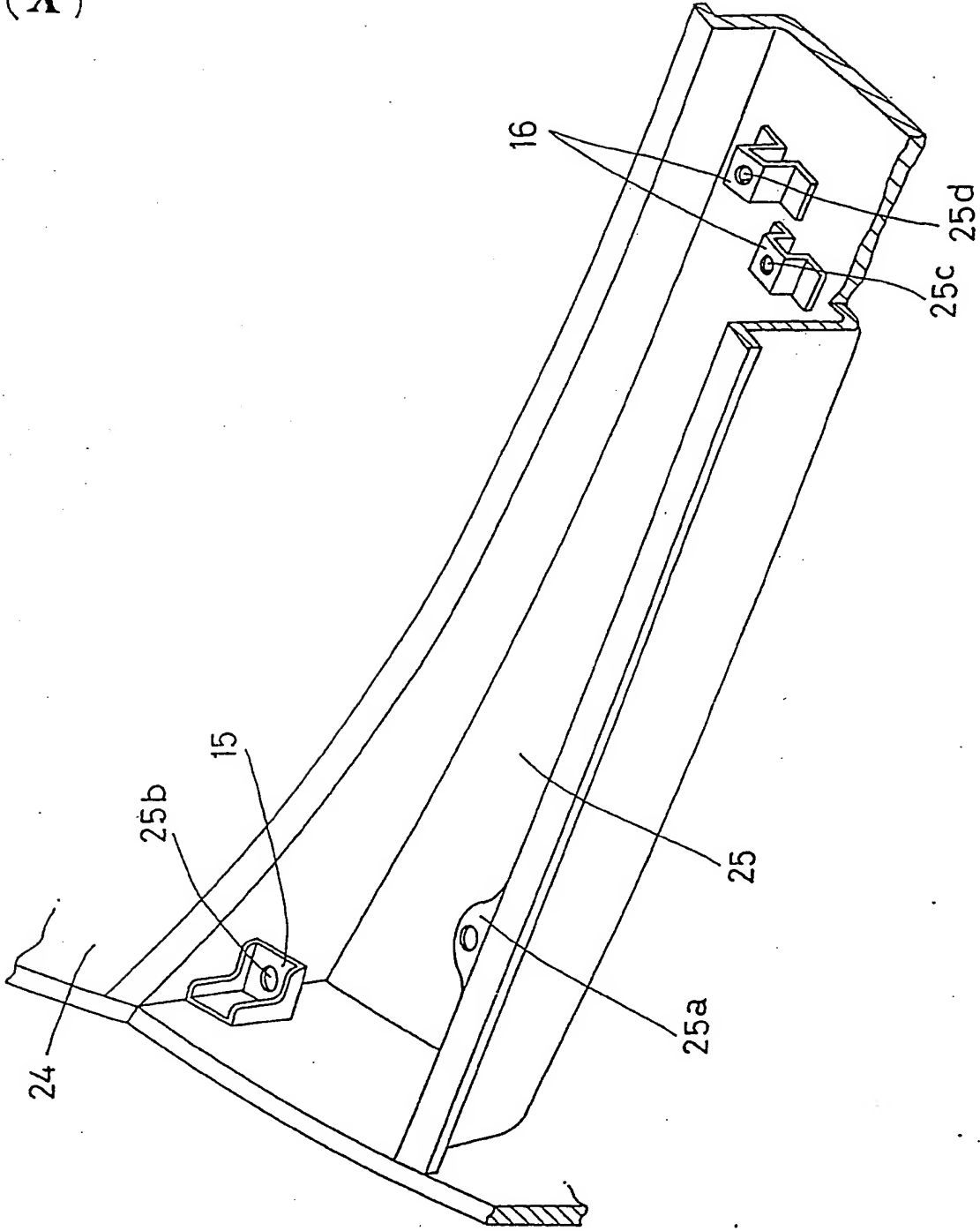


Fig 4 (X)

(Y)

Fig 4(Y)

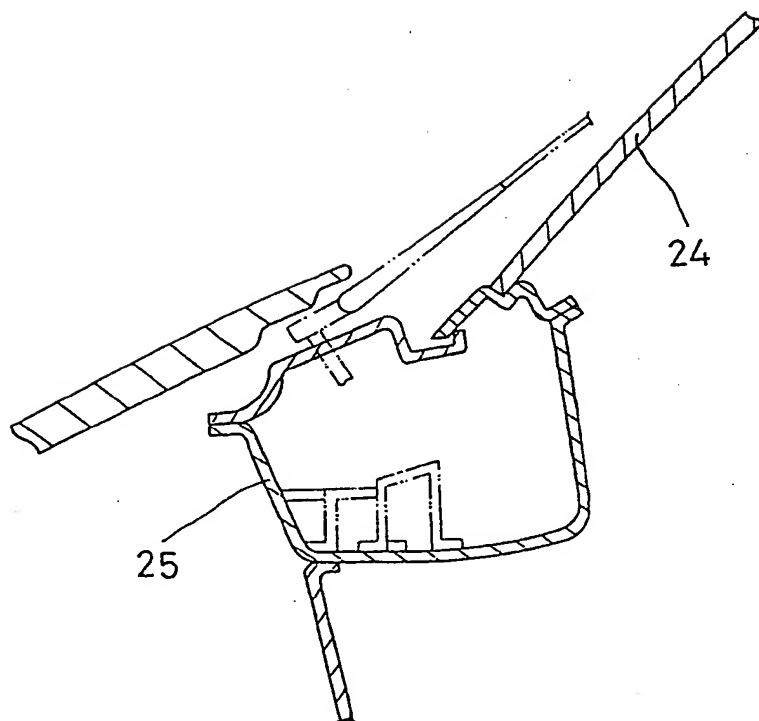


Fig 5

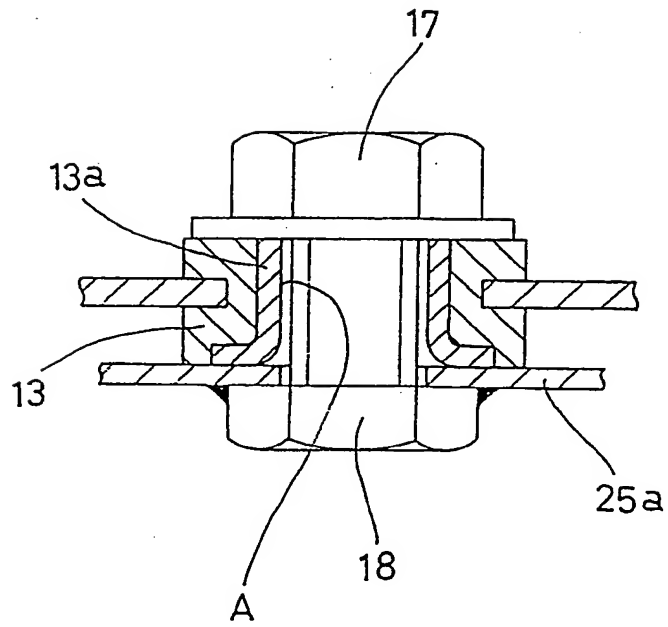


Fig 6

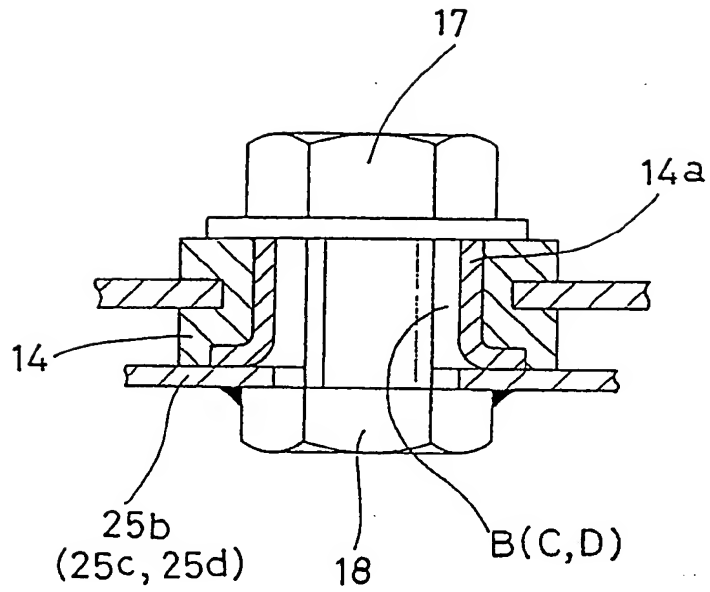
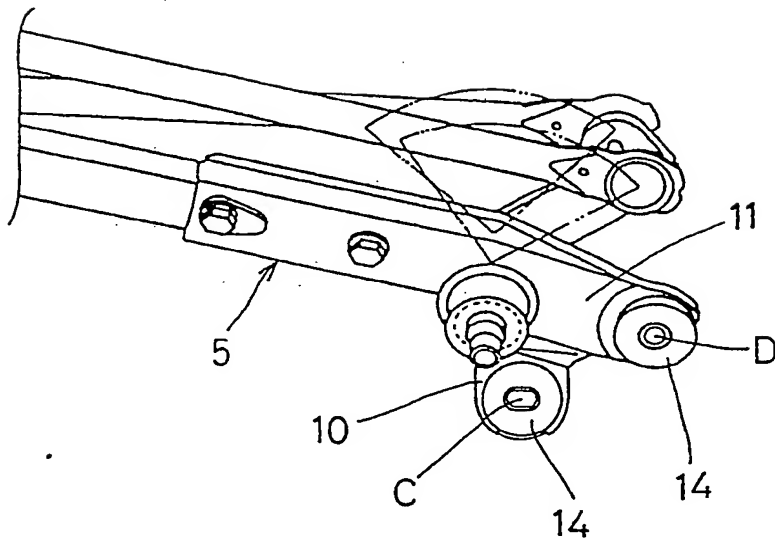


Fig 7



Mounting Structure for Modular-Type Wiper Device

The present invention relates to a mounting structure for a modular-type wiper device to be mounted on a vehicle such as a passenger car, bus, or truck.

A modular-type wiper device is an integral unit comprising various wiper components including a pivot shaft, a wiper motor, and a wiper link mechanism. Such an integral unit is mounted on a vehicle body. Thus, as compared with wiper devices whose components are separately mounted, the modular-type wiper device has an advantage that the mounting operation is relatively simple and the device strength can be enhanced, as needed, without depending upon the strength of the associated vehicle body. For this reason, wiper devices of this type are being extensively used nowadays.

Such a modular-type wiper device is mounted on a vehicle body in the following manner: The various components of the wiper device are incorporated into brackets, which have a plurality of mounting holes. At positions corresponding with these mounting holes, mounting seats are provided on the vehicle body, to which the bracket is

fastened by means of bolts and nuts. A problem with this structure is that there is a dispersion in the mounting pitch of the various wiper components and in the pitch of the mounting seats on the vehicle body side. The wiper device should be mounted with such a dispersion absorbed. Conventionally, the absorption of this dispersion has been effected by providing some clearance between the mounting holes and the bolts passed therethrough.

Such an arrangement, however, entails another problem of the generation of a positional dispersion between the vehicle body and the wiper device itself, thereby making it impossible to effect the mounting with high accuracy.

SUMMARY OF THE INVENTION

The present invention has been made in view of the above problems in the related art. It is an object of the present invention to provide a mounting structure for a modular-type wiper device which helps to clear away these problems. In accordance with the present invention, there is provided a mounting structure for a modular-type wiper device which is in the form of an integral unit including various wiper components such as a pivot shaft, a wiper motor, and a wiper link mechanism, the mounting structure comprising: brackets into which the above-mentioned wiper components are incorporated and which are provided with a plurality of mounting holes; and mounting seats, provided on .

a vehicle body, corresponding to the above-mentioned mounting holes, the wiper device being mounted and fastened by means of bolts and nuts, wherein at least one of the plurality of mounting holes is made as a small-diameter mounting hole whose diameter is smaller than that of the remaining mounting holes so as to reduce the clearance between it and the bolt passed therethrough, and wherein preferably the mounting seat for the bolt passed through the above-mentioned small-diameter mounting hole is provided directly on a cowl of the vehicle body.

With the above construction, the present invention enables a modular-type wiper device to be mounted on a vehicle body accurately and easily.

The invention will be described now by way of example, only with particular reference to the accompanying drawings. In the drawings:

Fig. 1 is a plan view of a wiper device;

Fig. 2 is a front view of the wiper device, with the wiper motor and link device thereof omitted;

Fig. 3 is a sectional view taken along the line X-X of Fig. 2;

Figs. 4(X) and 4(Y) are a plan view and a side sectional view of a cowl section;

Fig. 5 is a sectional view, respectively, of a section around a mounting hole A;

Fig. 6 is a sectional view of a section around a mounting hole B, C or D; and

Fig. 7 is a plan view of a section around mounting holes according to a second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention will now be described with reference to the drawings, in which numeral 1 indicates a modular-type wiper device, which includes first and second brackets 2 and 5. Formed on the first bracket 2 are: a sleeve 2a through which a first pivot shaft 3 is rotatably inserted, a pair of mounting sections 8 and 9 for integrally mounting the wiper device on a vehicle body, and a motor attachment section 2b to which a wiper motor 4 is attached. Formed on the second bracket 5 are: a sleeve 5a into which a second pivot shaft 6 is rotatably inserted, and a pair of mounting sections 10 and 11 for integrally mounting the device on the vehicle body. Each of the first and second brackets 2 and 5 is formed as an integral unit by aluminum die-casting (which may naturally be replaced by zinc die-casting). Further formed on the first and second brackets 2 and 5 are connecting sections 2c and 5b having a substantially U-shaped cross-sectional configuration. A frame member 7, likewise having a substantially U-shaped cross-sectional configuration, is fitted into the connecting sections 2c and 5b and integrally fastened thereto by means of bolts and nuts 12, thereby integrating the brackets 2 and 5 into one unit to form the modular-type wiper device 1.

Further, a first wiper link 21 is provided between a motor arm (not shown) attached to the motor shaft of the wiper motor 4 and a link arm 20 provided on the pivot shaft 6 on the side of the second bracket 5, and a second wiper link 23 is provided between the link arm 20 and a link arm 22 provided on the pivot shaft 3 on the side of the first bracket 2.

The mounting sections 8, 9, 10 and 11 are provided with mounting grooves 2d and 5c which are formed on the brackets 2 and 5, respectively, and setting rubbers, each having a hole, are set in these mounting grooves. A metal cylindrical member is fitted into the hole of each setting rubber. A setting rubber 13 set in the mounting groove 2d of the mounting bracket 8, one of the mounting sections of the first bracket 2, has a mounting hole A whose diameter is smaller than that of mounting holes B, C and D of setting rubbers 14 which are set in the remaining mounting grooves, i.e., the other mounting groove 2d and the mounting grooves 5c. Accordingly, the diameter of a metal cylindrical member 13a fitted into the setting rubber 13 has a diameter which is smaller than that of metal cylindrical members 14a which are fitted into the setting rubbers 14.

The above wiper device 1 is mounted on a cowl 25 provided in front of a windshield 24 of the vehicle body. Formed on the cowl 25 are mounting seats 25a, 25b, 25c and

25d, which are in positions corresponding to the four mounting holes A, B, C and D mentioned above. The mounting seat 25a which corresponds to the small-diameter mounting hole A is formed directly on the cowl 25 by drawing. The mounting seat 25b corresponding to the mounting hole B is formed on a mounting stay 15 which is welded to the cowl 25. The mounting seats 25c and 25d, which correspond to the mounting holes C and D, are formed on other mounting stays 16 welded to the cowl 25. With the mounting holes respectively facing the corresponding mounting seats 25a through 25d, bolts 17 are inserted through the mounting holes A through D and are threadedly engaged with nuts 18 which are welded to the mounting seats 25a through 25d, thereby integrally fastening the wiper device 1 to the vehicle body. The outer diameter of the bolts 17 is determined such that there is substantially no play between the small-diameter mounting hole A and the bolt 17 passed therethrough, whereas there is some play between the remaining mounting holes B through D and the bolts 17. In the drawings, numeral 26 indicates pivot caps fitted onto the pivot shafts 3 and 6.

In this embodiment of the present invention, constructed as described above, the wiper device 1 is formed as a modular type by integrally connecting the first and second brackets 2 and 5 through the frame member 7. When mounting this wiper device 1 on the vehicle body, the

mounting holes A through D of the device are positioned in such a way as to respectively face the corresponding mounting seats 25a through 25d. Then, by passing the bolts 17 through the mounting holes for threaded engagement, the wiper device 1 is integrally attached to the cowl 25 of the vehicle body. Here, one of the mounting holes (the mounting hole A) has a relatively small diameter and there is substantially no play between this hole and the associated bolt 17. Accordingly, this small-diameter hole serves as a positioning reference when the wiper device 1 is mounted on the vehicle body. The remaining mounting holes B through D have a relatively large diameter, so that there is some play between them and the bolts 17. Therefore, any dispersion in the pitch of the mounting seats will only results in a radial displacement of the inserting positions of the bolts 17 with respect to the mounting holes B through D, thus enabling the wiper device to be mounted with such a dispersion absorbed.

Thus, in the present embodiment, the wiper device 1 is mounted by using the four bolts 17, and one of the mounting holes (the mounting hole A) has a relatively small diameter so as to serve as a positioning reference, thereby enabling the wiper device 1 to be mounted with high accuracy. Furthermore, since the remaining mounting holes have a relatively large diameter, an accurate mounting is ensured

in which any dispersion in the pitch of the mounting seats, etc. is absorbed.

Moreover, since the mounting seat 25a corresponding to the small-diameter mounting hole A is directly formed on the cowl 25, the wiper device 1 can be directly mounted on a cowl basis, thereby making it possible to achieve mounting with higher accuracy.

In addition, the small-diameter mounting hole A in this embodiment is at a position between the remaining mounting holes B through D so as to reduce to a minimum the dispersion in mounting-seat pitch for the mounting on a vehicle-body basis, thereby further enhancing the accuracy in mounting.

It goes without saying that the present invention is not restricted to the above-described embodiment. Apart from a modular-type wiping device which is based on two brackets which are integrated through a frame member, the present invention is applicable to a type of wiping device which is based on a single integral bracket. Further, as in the second embodiment shown in Fig. 7, of the remaining mounting holes B through D, the mounting hole C, may be formed as an elongated hole, thereby enabling the wiper device to be mounted with still higher accuracy.

Thus, in accordance with the present invention, a modular-type wiper device, based on brackets into which the

various components of the wiper device are incorporated and which have a plurality of mounting holes, is mounted on a vehicle body by means of bolts and the mounting holes, one of the mounting which has a relatively small diameter so that there is substantially no play between it and the bolt passed therethrough. Thus, by using this small-diameter mounting hole as a mounting reference, the wiper device can be positioned in a satisfactory manner with respect to the vehicle body when it is mounted thereon. Further, the remaining mounting holes have a relatively large diameter and there is some play between them and the bolts, so that any dispersion in the mounting seats will only result in a radial displacement of the inserting positions of the bolts with respect the remaining mounting holes, thus absorbing such a dispersion. Thus, by using one mounting hole having a relatively small diameter as a reference, a high-accuracy mounting of a wiper device can be achieved easily and reliably.

Further, when the mounting seat corresponding to the small-diameter mounting hole is formed directly on the vehicle body side, the wiper device itself can be mounted directly on a vehicle-body basis, thereby enabling the wiper device to be mounted with a still higher level of accuracy.

CLAIMS:

1. A mounting structure for a modular-type wiper device which is in the form of an integral unit including various wiper components such as a pivot shaft, a wiper motor, and a wiper link mechanism, said mounting structure comprising: brackets into which said wiper components are incorporated and which are provided with a plurality of mounting holes; and mounting seats provided on a vehicle body in correspondence with said mounting holes, said wiper device being mounted and fastened by means of bolts and nuts, wherein at least one of said plurality of mounting holes is formed as a relatively small-diameter mounting hole whose diameter is smaller than that of the remaining mounting holes so as to reduce the clearance between it and the bolt passed therethrough.
2. A mounting structure according to claim 1, wherein the mounting seat for the bolt passed through said small-diameter mounting hole is provided directly on a cowl of the vehicle body.
3. A mounting structure according to claim 1 or claim 2, wherein the bolts of the relatively large diameter mounting holes are a clearance fit in said holes.
4. A mounting structure substantially as hereinbefore described with reference to and as shown in Figs. 1 to 6 or Fig. 7 of the accompanying drawings.

11

Patent Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

GB 92195 00

Relevant Technical fields

(i) UK CI (Edition K) A4F (FAB, FAC, FADA, FADB,
FADC, FADD)

(ii) Int CI (Edition 5) B60S

Search Examiner

T M JAMES

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Date of Search

15 SEPTEMBER 1992

Documents considered relevant following a search in respect of claims 1-4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2228188 A (MITSUBA) see page 5 line 28 - page 6 line 7, page 7 lines 3-11, page 8 lines 17-36 and figure 11	1-3

Category	Identity of document and relevant passages	Relevance to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).